No 55 Ch

Jan 9th 126 Arch Street

An Paper M. 9th. 1828

Inaugural Essay

On Cynanche Trachealis

For the degree of Doctor of Medicine

in the University of Pennsylvania

By

Evans L Amacker of South Carolina

Philadelphia 7th January 1828

G

Cynanche Trachealis

This disease is of comparatively modern origin. Descriptions of it are indeed to be found in the writings of Boerhaave, Martin Ghisi and others yet little appears to have been known of it until it noticed by Home of Edinburgh about the middle of the last century, and to him writers generally ascribe the honor of having earliest directed the attention of the medical profession to it as a distinct disease.

It is not essential to the purpose of this essay to inquire whether the origin and nature of Croup was known to the ancients or not, as it is now sufficiently ascertained to be of very frequent occurrence and familiar to physicians as well in this as most other countries since the period at which Home made it the subject of his inquiries. Caused by atmospheric vitiation and excited by sudden vicissitudes of temperature croup begins its ravages at an early season. Children, more particularly those from one to three or four years old, are the peculiar

objects of its attacks. Yet it is not wholly restricted to early life as Cullen and Thomas declare. No age, sex, or condition is entirely exempt from its molestation. It not only invades the cradle sacred feebleness, but assails the youth in his maridian and harasses even the decline of silvered age. To the truth of these remarks the experience of many eminent practitioners of our country bears ample testimony.

Depending upon atmospheric distemperature the disease has been supposed to be confined to the sea coast, and as a cold and moist atmosphere is observed to be the element in which it flourishes the coast is well calculated to favour its production and promote its dissemination. Low marshy places in upland situations afford also a fruitful source for its generation and a wide sphere for its action as is proved by Rush, Currie, Cullen and Homes.

Concerning its contagiousness medical opinion at this day is pretty well settled and most pathologists concur

in divesting it of that formidable property. There are many however who still maintain that it is contagious. Of these not the least conspicuous is Gregory of Edinburgh who believes it always in its malignant form capable of communicating itself by contagion. But the cases in which he appears to apprehend this power were probably complicated with other diseases upon which croupy symptoms supervened. This at least seems to be the suspicions of Cheyne who has written ably on the complaint.

Croup truly inflammatory in its nature and existing independent of other diseases, acknowledged to be infectious. I do not believe myself is ever propagated upon this principle: Indeed with Dr Hosack I would as soon suspect phrenitis a inflammation of the pleura.

Some places appear peculiarly liable to this disease. In Edinburgh croup is scarcely known, while in the seaport of Leith, but a few miles distant, it prevails to such an extent that the inhabitants can with difficulty raise their children: in Baltimore also it is of

rare occurrence, while Fells point which bears pretty much the same relation to that City, as Leith to Edinburgh is desolated by it early in the Spring. It occasionally also prevails epidemically.

Writers usually divide Croup into two species, spasmodic and inflammatory. Here also as in most pathological questions we find medical opinion at variance. By many it is asserted to be wholly spasmodic, and the disposition which it sometimes manifests to occasional exacerbations of all its symptoms assumed as evidence of its true nature and declares unequivocally its spasmodic character. But that it is most commonly if not always inflammatory, I think is manifestly obvious, not only from the symptoms, the manner of attack and the appearances after death, but from the fact that it is uniformly attended with a secretion which characterises that action and a practitioner of St Gate eminent for his professional abilities, says, I have never in the whole course of twenty years practice seen a case of spasmodic Croup, neither

have I seen a case that was not followed by a spasmodic affection of the part: With this Dr Dewees experience also corresponds. Dr Chapman however admits the distinction and observes that when the attack is sudden and violent it partakes more or less of spasms and on the contrary when it comes on gradually as an original or a consequence of disease slowly developing itself it is certainly of an inflammatory character. He considers it in the first instance inflammatory or spasmodic and as eventuating in a genuine peripneumony. This opinion Cheyne and Battie seem also to have entertained.

By Cullen and Bard croup is said to be symptomatic of many other diseases and according to Rush measles, small pox, putrid aphthae, catarrh and pneumonic inflammation have all given rise to it. Ferriar relates two cases that supervened ulcerated sore throat. Cheyne and Hosack have seen it attend scalatina and Sayre witnessed it from yellow fever. Caldwell believes it always original and never produced by any irregularities in cynanche Maligna or tonsillaris. Certainly it may follow as a sequel or attend as

a concomitant any of the diseases enumerated, but cannot be considered as a symptom of either since they usually exist independent of each other.

The tender and delicate constitution of children is most generally the subject of this complaint, for the system appears to loose the susceptibility to it in maturity. The younger the child the more liable will it be to the affection and when once attached becomes more obnoxious to it from the slighthest causes. Catarrhal affections full robust habits and a cold, damp atmosphere also predispose to it: it therefore occurs most frequently in the winter and spring seasons when the weather is moist and austere, and is seldom known in the summer. It is also observed to be more common in cold and temperate climates than between the tropics.

Little else seems necessary to excite it at once into action than an exposure to cold particularly cold and windy weather.

The proximate cause consists in an inflammation of the mucous membrane lining the trachea.

The disease is not confined to the upper part of the Trachea as Cullen inculcates, who in his nosology defines croup to be an inflammation of the mucous membrane & contiguous muscles of that part attended with fever &c. but it involves the whole respiratory organ extending itself into the bronchia and even to the surfaces of the lungs as post mortem examinations demonstrate.

The manner and time of its attacks are various: sometimes it steals into the system so insidiously as scarcely to be remarked by any complaints of the child. I have, says Gregory, seen a child taking its food and running about while the disease was making rapid advances. In other cases it comes on so suddenly and violently that the patient is instantly seized with a great difficulty of breathing and a shrill crouping noise. Most generally however I believe it attacks early in the morning & late at night while the child is in bed without any premonition, or it may be preceded by indisposition similar to that observed in common colds.

As regards the stages of this complaint writers are very obscure: none that I have read seem to have paid so much attention to this point as Drs Hosack and Lewis. They very judiciously divide it into three stages, which not only facilitates but renders the treatment more systematic and scientific.

The first or forming stage. Here the affections appears to be local, the system not yet participating in the evils which are soon to follow. The first thing remarked is a slight irritation and stricture about the throat provoking a peculiar sonorous hoarse cough, which returns in paroxysms and the child is under a degree of excitement rather pleasurable than painfull. At this period the voice is not yet sensibly altered; the general circulation is undisturbed and the respiration free and open; the child continues cheerful or even becomes morbidly exhilerated and its appetite and digestion remain unimpaired. This state of things may in some instances subsist for two or three days without much augmentation

and is very deceptive making the practitioner & parents suspect nothing more than an attack of common catarrh, until the disease long maturing suddenly and violently developes itself: in others the formation is so short and rapid as hardly to be recognised

Dr Jeewees thinks he has observed in the forming stage, particularly in the slow and insidious attacks, the hands to be more than usually cool and the face unnaturally pale resembling in some degree the cold stage of an intermittent, the patient himself however feels no sensation of cold. But where the attack is sudden this condition is by no means so conspicuous or perhaps not at all perceptible. During the existence of this stage the secretions from the nose and mouth are much diminished or totally suppressed and continue so throughout unless a happy solution is effected. Hence the troublesome sneezing and distressing thirst which prevail. The cough is short and for the most part dry, but occasionally it is accompanied with an expectoration of small quantities

of a thin whitish mucus. On examining the internal fauces nothing remarkable is presented except that the vessels are rather more injected than natural. After a continuance of the above symptoms for a longer or shorter time a change takes place in all of them, while others still more formidable are superadded indicating the second or inflammatory stage

In this stage the constitution is implicated and the whole system feels the morbid impression. Here the voice is observed to be effected by the hoarseness: the cough also is now more frequent and the paroxysms longer attended too with a more acute sound than was noticed in the first stage: every inspiration too is accompanied with a more uniform wheezing and greater shrillness than was perceived in the first. A degree of exhaustion with an increase of the difficulty of respiration succeeds every effort to cough: the face becomes suffused, which however partially subsides after the exertion, as the pulse tranquilises.

In most cases the circulation is greatly accelerated evincing much febrile commotion: but in some there is

little vascular excitement: when this latter obtains, the face is seldom flushed and the extremities are rather cooler than natural. The child shews considerable disposition to sleep and declines into frequent but disturbed slumbers from which he is suddenly roused by a most violent fit of coughing and increased oppression. He cries and struggles to raise himself from the bed; every symptom soon becomes aggravated and if not arrested advances rapidly to the third or Congestive stage.

The respiration is now rapid and no interval occurs, and as soon as the parts become distended with blood an effusion of a thick tenacious fluid into the trachea takes place, which increases still farther the oppression and difficulty of breathing. The cough is now more frequent in its recurrence and more permanent in duration, terminating sometimes in a discharge of a puriform matter or pieces of coagulable lymph, resembling membrane, but which affords no alleviation. The child from this time becomes extremely restless, throws himself from

side to side and alternately tries every position without obtaining relief from any of his sufferings, scarce even escapes impending suffocation. The face is now no longer flushed; a dark lividity prevails in its place, which occasionally extends even to the neck; the gums are white and pale; the tongue black and swollen and the lips turged and purple. The forehead assumes a glossy appearance and the skin looks as if it were lightly drawn over it. —

The countenance now becomes haggard and anxious beyond description; the eyes seem to project from their sockets; the heart throbs violently, a cold perspiration appears over the surface, the pulse fails, violent fits of coughing and convulsions come on and the patient is suddenly carried off, in a paroxysm of dyspnoea. In this last stage thirst is sometimes so excessive as to make the demands for drinks irresistable, though each attempt seems to threaten immediate death.

The disease runs its course sometimes differently; sometimes it lingers for days, while at others, its course is

finished in a few hours: this variety in termination, will depend upon the constitution, the nature of the remedies, the period at which they were applied and their influence upon the system.

Dissections of the bodies of children who have fallen victims to this complaint uniformly discover the lungs in a highly morbid state. In some instances they are found inflamed and hardened through their whole texture or at particular points of their surfaces, with adhesions of the pleura in various places: at other times they are filled with a dark bloody serum or large accumulations of pus or coagulable lymph; water has also been found in the pericardium. Bard remarks that upon dividing the lungs with a knife, it feels like cutting into the liver. Cheyne makes the same observation. The most common seat, however of deviation from the natural structure, seems to be the trachea where the effusion appears like a membraneous concretion of variable colour and consistency as it were lining the whole internal surface of that Tube.

Death in this disease I believe almost always results from

a mechanical obstruction and not from spasms as is generally supposed: at least dissections prove that obstruction is the most frequent cause. Indeed the very organisation of the trachea and the disposition of its muscles, so completely antagonising each other, seem to preclude the possibility of a total occlusion of its passage by spasms. Doubtless in the latter stages of the complaint, where effusion has taken place and violent exertions are made to cough, spasms may and probably do assist in hastening the fatal event.

What constitutes the great peculiarity of croup is its constant tendency to the formation of a membrane which is perpetually endangering suffocation.

As regards the nature of this membrane, some declare that it is nothing more than inspissated mucus; others that it is a specific secretion from the exhalents. Neither of which I believe to be correct. It cannot be formed by evaporation and absorption of the finer parts of the common mucous secretion in the one case for we see similar production in dysentery where the one is suspended and the other cannot

possibly act: moreover it is too rapidly formed to admit of either processes, for scarcely is one removed before another occupies its place. And in the other, I would rather attribute it to the intensity than to the specific nature of the inflammation. Thomas says, if it was like that met with in common we might expect to find the same kind of concretion on the surface of the trachea every day, as its mucous membrane is so frequently the seat of inflammation, attended with increased secretion. May we not ourselves ask, if it is peculiar or specific, ought we not with more certainty expect to find it in every case of the disease itself? But extensive observations prove the contrary, for it is rarely produced. To this point we have the very high authority of Drs Chapman and Ames, who assert that the elimination of a membrane is not a necessary consequence of the disease, they having never met with it in the whole course of a very ample experience. It cannot however be supposed, as some would insinuate, that it has never been seen, for we have the fact attested by

writers of the first respectability.

The symptoms of Croup are so peculiar and distinctive that it is not easily confounded with any other disease. Asthma most nearly simulates it, but they will readily be distinguished by attending to the different circumstances of the two disorders. In Croup the cough is frequently ringing in our ears: whereas in asthma there is little or no cough: Croup is regular and constant in its progression asthma is marked by considerable remissions, attended with some evacuation, such as belching, vomiting or purging. In the former there is a strong, active pulse with much febrile excitement, high coloured urine and a small shrill voice: in the latter altho the pulse is equally quick, it is less full, the urine limpid and the voice deep and croaking.

The prognosis is perhaps equally certain. The danger will depend upon the age, habit and constitution of the child, its former attacks, the duration and violence of the disease. The symptoms which indicate a favourable

termination, are a subsidence of the inflammation and fever, relaxation of the spasms, relief to the dyspnoea, free expectoration, moist skin and the voice gradually recovering its natural tone. On the contrary those which denote a fatal tendency are great difficulty of breathing, high fever, frequent and violent fits of coughing, dry skin, the voice becoming more shrill and the pulse irregular and intermitting.

On the treatment to be adopted for the cure of croup I shall not descend into details: but will briefly describe that mode which has been found to be the most successful and generally pursued by the most learned and experienced practitioners; every writer differing about the nature & character of the complaint, their practice of course partakes of the same contrariety.

Croup is justly esteemed a dangerous disease and perhaps in the whole catalogue of human afflictions there is none which wears a more formidable aspect or whose treatment has hitherto been more feeble and undetermined

from the erroneous notions entertained of its pathology. Highly inflammatory in its nature, located too in an organ eminently vital, it is alarming, and calls for the most prompt and energetic measures.

Cullen very properly remarks that the whole antiphlogistic plan is necessary in the management of croup: and Dr Hosack not unjustly observes that Hamilton has betrayed much ignorance in recommending calomel altogether. Rundell too conceiving it to be spasmodic advises little else than blisters.

From what has been said it will be perceived that the first stage is our time for action, for recoveries seldom occur after effusion into the trachea has taken place: even if by the efforts of nature or art the child passes through the third stage, convalescence is so tedious and relapses occur so readily from the slightest causes as to make it final restoration to health doubtful. This stage seldom lasts long, though Dr Hosack has seen patients linger in it for three or four days. The indication in each

stage is to restore the lost secretions, and for this purpose nearly the whole class of emetics has been recommended at different times by different practitioners. But the tartar emetic, being prompt and of easy exhibition, should be preferred, and it given in large and reiterated doses until vomiting is induced. The physician should never depend upon the mother to give the emetic, but by all means see it given and make it a rule never to leave his patient until he has obtained a truce of the complaint

With the enlightened woman, the mother under the full operation of all those tender feelings which her relation inspires, this precaution must be unnecessary and to the practitioner, knowing the inveterate nature of the disease, the admonition superfluous; yet it is well to be advised that death has actually occurred from a want of attention on the part of the parent. I have, says Dr Hosack in twenty years lost but three patients, and one of them from the negligence of the mother. At the same time, or even previously to the emetic, the external throat should be inflamed by

repeated applications of the spirits of turpentine, hartshorne or mustard and vinegar: care however should be taken, and, by a too rapid or powerful irritation, to produce vesication.

Some prefer expectorant doses of the emetics at first and afterwards to extort emesis if the urgency of the symptoms demand it. But as the good effects of medicines in this complaint appears to be proportioned to the promptness and energy of their impressions on the system, I should advise full vomiting at once. The relief obtained from vomiting is immense, from the discharge of large quantities of a thick ropy mucus and the breaking out of perspiration. The bowels, which will generally be found costive, should be opened by some brisk purgative, such as castor oil, calomel alone or in combination with rhubarb or jallap with stimulating enemata immediately after the emetic. These by emptying the alimentary canal of its contents and by their irritation on the stomach, assist very much the operation of the other remedies.

These measures should be promptly employed and steadily

persisted in, and if our medicines act with their wonted kindness we shall not fail to controul the disease and prevent its full developement. In corroboration of the general intention the antiphlogistic regimen should be rigidly observed: the diet should consist simply of barley water flax seed tea, warm lemonade or Molasses whey: the patient confined to an atmosphere of a moderate temperature and most carefully guarded against exposure to cold, or a draught of air: the throat should be protected by a peice of flannel or some other warm envelope, after the rubefacients are laid aside. With this treatment Dr Chapman says the attack must be very obstinate if it does not yield.

In the forming stage Rush recommends antimonial Wine, emetic tartar, ipecac and oxymel of squills and says they rarely fail to arrest its progress. The tartar emetic, however seems alone to merit our confidence: the Wine and squills are too feeble and doubtful: the first six hours is our precious time and should not be

spent in idly temporising. Should the disease resist the treatment we have inculcated and continue to increase, or should unfortunately the physician not have been called until this first stage has passed, we shall have the second, which will require other and more powerful means.

Symptoms of the second stage existing, we should resort immediately to venesection. To be useful the blood should be taken suddenly, plenos rivo, from a large orifice in considerable quantity, even ad deliquium animi, to overcome the high arterial action and divert the flow of blood from the part. With this view, the external jugular vein, or a vein at the arm may be opened, or where there is any difficulty in effecting this, from the depth of the veins, we may with ease and equal utility, puncture those on the back of the hand, putting the hand for a few minutes in warm water previously to the operation. The propriety of large bleedings has been much controverted by practitioners though perhaps not upon sufficient grounds. No one doubts

the
cas
the
Hob
lind
of
na
lve
m
fin
da
o
pec
an
the
du
-ca
as
wh

the importance, efficacy, and necessity of the lancet in this case: its use then must be regulated by the discretion of the physician and the intensity of the symptoms. Dr Hobsack is more partial to small and frequent bleedings, but at the same time observes, we should let the effects of our lancet be seen in the paleness of the face and nausea of the stomack. Blood may also be detracted locally by means of cups; the back appears to be the most eligible situation for their application not only from the intimate connection between the parts, but the danger of suffocation when fixed near the throat.

Dr Lewis proscribes the employment of leeches, so peculiarly adapted to children according to Good, Gregory and others, as they do harm by exposure of the parts to cold, the slowness of the operation and uneasiness the child suffers during abstraction. By some venesection has been deprecated and laudnum recommended as likely to give as prompt & permanent relief as any other means; than which nothing can be more futile, unscientific and preposterous.

Directly after bleeding a large dose of emetic tartar should be administered, and a blister, sufficient to extend from ear to ear applied to the throat, if the difficulty of breathing continues and the cough is not loose, and such a quantity of calomel given as will procure a copious evacuation from the bowels. Severe purging seems to be unnecessary and sometimes even injurious, for it rapidly diminishes the strength of the patient without at the same time weakening the disease, though there is evident utility in having the alimentary canal freely opened. If the child is not yet relieved and the symptoms appear to augment, the bleeding, blisters with tepid baths, emetics and warm fomentations to the parts should be repeated again and again, so long as they are violent. In the meantime, calomel and tartar emetic or James powders, in proper doses, should be exhibited every two hours, until the cough ceases. The greater the disposition the disease has to run a rapid course, or the more sudden and violent the attack, the greater will be the chance of success from the use of proper remedies.

Where the other medicines fail, the seneka tea in tea spoonful doses frequently repeated, as advised by Dr Archer, may be used, and here it is said to display its highest powers, restraining the disease promptly and releaving especially the feelings of oppression. Dr. Stearns considers croup to arise from a torpor of the absorbents: on the contrary we have symptoms of the most exalted inflammation, he gives calomel but makes it answer for all other medicines by giving immense doses of it. If the disease does not abate soon after the accession of this stage; under the treatment just detailed, it passes on to the third, where effusion from the inflamed vessels is the consequence. At this time there is little hope of recovery, since we can seldom with certainty remove the existing obstruction and so alter the action of the vessels as to prevent new accumulations; yet we should not wholly despair. In this stage we must not fearlessly wield the Lancet as Dr Dick of Alexandria did, for the system, already prostrated by the violence of the disease, may sink under the operation, beyond

recovery, nor incautiously open the trachea, as suggested by Home; for the disease is not confined there, as before stated. It will be proper, in the first place, to immerse the patient in a warm bath for fifteen or twenty minutes, and give a large dose of tartar emetic, apply fomentations by means of cloths rung out of hot water and a blister large enough to cover the whole chest, at the same time irritating the external throat with a mixture of spirits of turpentine and tincture of cantharides. In cases when the pulse will not admit of a vein being opened, we may recur with much advantage to cups - I have, says Dr Chapman, seen a child apparently in articulo mortis saved by a few ounces of blood taken in this way. It is in this stage, that Dr Thacher and Hosack think the Senka, as advised above singularly efficacious and peculiarly applicable: indeed it appears to be the only article in which most practitioners confide at this time.

To assist expectoration and maintain a determination to the skin, the oxymel of squills, tartar emetic, antimonial

Wine or senecka tea should be given, in small and repeated doses in conjunction with the warm bath and the liberal use of calomel. Dr Bard and Francis have found the White and blue vitriol succeed in removing the obstruction and thereby saving the patients life, after all other means had failed. Dr Sewees thinks he witnessed much relief in one case, from twenty to thirty drop doses of the spirits of turpentine. The garlic has also proved useful. —

After the inflammation has subsided, Thomas thinks laudanum alone or in combination with the antimonial solution will be useful in lessening the spasms: inhaling the vapour from hot water, to which a little ether has been added, he also thinks will prove a good subsidiary. The use of this last however will seldom be practicable, from the extreme restlessness of the child. Probably, in this state combinations of calomel, opium and ipecac, would answer a better purpose. By some, the tincture of digitalis has been used, with benefit in some cases of croup, and with others, salivation has

has proved successful. At this period, the patient strength should be supported by appropriate nourishment, such as arrow root, tapioca, sago, panado, chicken soup and the occasional indulgence of a little wine whey.

Such however is the intractable nature of croup and such the rapidity of its march, that we shall often find our best hopes disappointed, the system sink and the child eventually die, even under the best directed and well devised practice.

As a dernier resource, bronchotomy has been advised: that it may prove useful in cases wholly spasmodic, is presumable, but it cannot possibly give relief in cases purely inflammatory.